Université Claude Bernard Lyon 1- Hosting offer for a MSCA Post-doctoral fellowship candidate

in **Physics-based models for urban mobility**

Host Organisation	**Université Claude Bernard Lyon 1**
Laboratory	**Institut Lumière Matière**
Website (lab / research team)	https://www.alexandrenicolas.net/
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Host Organisation

The Université Claude Bernard Lyon 1 welcomes Marie Sklodowska Curie Postdoctoral Fellowships applications !

With 62 laboratories and more than 7000 publications per year, and leading French university in terms of the number of patents filed in collaboration with industry, Lyon 1 contributes to scientific and innovation progress in numerous fields: health, mathematics, IT, physics, chemistry, earth and space sciences, life sciences, etc. Creator of emerging knowledge and new technologies, the University is consolidating its research excellence on a global and international level by developing inter- and multidisciplinary approaches targeting the major challenges facing today society.

Host research lab

***Institut Lumière Matière* is a leading research lab in Europe.** With close to 300 members (*researchers, lecturers, PhD students, technicians, administrative staff*), it is one of the largest labs in its scientific field in the metropolitan area of Lyon. Its research activity spans experimental, numerical, and theoretical approaches and covers a very broad range of topics related to Physics, from laser physics to biophysics and condensed matter theory; this breadth fosters collaborations and innovations at the interface between disciplines.

Within this Institute, the Condensed Matter and Interface Modelling team gathers researchers who leverage cutting-edge numerical and theoretical approaches to address a broad range of topics in condensed matter, light and matter interactions, and collective effects.

Hosting Offer

The team offers to host a MSCA Postdoctoral Fellowship candidate (typically a post-doc of less than 8 years research experience since PhD defence), submitting an application to the next MSCA-2024 - PF call for proposals (deadline 11th September 2024), intent on exploring one of the following questions in keeping with

Physics-based approaches to address contemporary urban mobility problems:

* Exploring the dynamics of pedestrian crowds in dense urban settings, with a focus on the effect of anticipation

* Developing new modelling frameworks for active modes and micromobility (bikes, e-scooters, etc.), with physical insight

* Modelling and assessing the impact of perturbations on vehicular traffic in cities with a statistical physical approach

The fellowship could last for 12 to 36 months, depending on the type of Postdoctoral Fellowship.

Supervision

The successful Marie-Curie Post-doctoral fellow will be supervised by Dr. Alexandre NICOLAS. Alexandre is a tenured Researcher (“Chargé de recherche) at CNRS, the French National Centre for Scientific Research. Over the past few years, he and his team have pioneering novel approaches to urban mobility problems, from crowd dynamics to the cruising traffic in city centres. These developments, located on the crestline between fundamental advances and solutions to concrete issues, have attracted considerable attention and are notably reflected in the recent key publications that follow:

Cordes, J., Schadschneider, A., & Nicolas, A. (2024). Dimensionless numbers reveal distinct regimes in the structure and dynamics of pedestrian crowds. *PNAS nexus*, ***3***(4), pgae120.

Echeverría-Huarte, I., & Nicolas, A. (2023). Body and mind: Decoding the dynamics of pedestrians and the effect of smartphone distraction by coupling mechanical and decisional processes. *Transportation research part C: emerging technologies*, ***157***, 104365.

Mendez, S., Garcia, W., & Nicolas, A. (2023). From Microscopic Droplets to Macroscopic Crowds: Crossing the Scales in Models of Short-Range Respiratory Disease Transmission, with Application to COVID-19. *Advanced Science*, ***10***(19), 2205255.

Dutta, N., Charlottin, T., & Nicolas, A. (2023). Parking search in the physical world: Calculating the search time by leveraging physical and graph theoretical methods. *Transportation science*, ***57***(3), 685-700.

Application process

Interested candidates are invited to contact us exclusively by email (**alexandre.nicolas@cnrs.fr**)

Make sure that you include the reference to this offer in the title of your email. Please attach a CV, a motivation letter, your MSc marks, **as well as a 1 page research proposal**.

Professional grant application support:

Candidates will receive the support of the supervisors, as well as online training from a professional grant application company, and advices from successful applicants, to prepare and submit their application with the Institut Lumière Matirèe as a host laboratory, to the next MSCA-PF call for proposals.